# Freeform Search

D	us Pate Us OCF atabase: EPO Ab JPO Abs Derwent	Grant Publication Full-Text Database ents Full-Text Database R Full-Text Database estracts Database stracts Database t World Patents Index chnical Disclosure Bulletins		
Т	erm:			
D	isplay: 50	Documents in <u>Display Format</u> : - Starting with Numb	er 1	_
	1 0 ,	List • Hit Count • Side by Side • Image	/CI   <u>·</u>	
		Search Clear Interrupt	_	
		Search History		
DATE:	Friday, Novem	ber 10, 2006 Purge Queries Printable Copy Create C	ase	
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<u>L2</u>	L1 and (software or application)	3	<u>L2</u>
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# END OF SEARCH HISTORY

Freeform Search

Page 2 of 2

First Hit Fwd Refs

Previous Doc Next Doc Go to Doc#

Generate Collection Print

L6: Entry 14 of 15

File: USPT

Sep 7, 1999

DOCUMENT-IDENTIFIER: US 5950207 A

TITLE: Computer based multimedia medical database management system and user

interface

### Brief Summary Text (9):

Hard copy analysis and archiving systems are often employed even where the original data is in <u>digital</u> form. Medical facilities often generate and maintain medical images, <u>patient</u> information, and diagnostic <u>reports in a digital format</u>, but present the information to the user as hard copies. Similarly, images generated by <u>digital</u> imaging techniques, such as ultrasound, nuclear medicine, <u>digital</u> fluorography or angiography, computerized tomography ("CT"), magnetic resonance ("MR"), and computerized radiography, are initially generated in <u>digital</u> form, then transferred to a hard copy for presentation to the <u>radiologist</u> or clinician. The hard copy is easier than the <u>digital</u> data for the analyst to <u>access</u>, handle, and visualize. The <u>digital</u> data, on the other hand, is often discarded immediately or shortly after creation; alternatively, the original <u>digital</u> data may be maintained only as a backup to replace lost or damaged hard copies, while the hard copies are traditionally used for analysis and long-term archiving.

Previous Doc Next Doc Go to Doc#

<u>First</u>	<u>Hit</u>	<u>Fwd</u>	Refs
Trad	of D	ocult	Sat

Previous Doc

Next Doc

Go to Doc#

Ena of Result Set

Generate Collection

**Print** 

L2: Entry 3 of 3

File: USPT

May 11, 1999

DOCUMENT-IDENTIFIER: US 5903889 A

TITLE: System and method for translating, collecting and archiving patient records

#### Brief Summary Text (7):

Furthermore, even many hospitals with database systems lack a centralized retrieval system because related hospital reports are often stored on separate databases. For example, a patient's radiology catheterization report and hemodynamic catheterization reports may be created and stored in separate databases, though as far as the physician who performed the catheterization procedure is concerned, these two reports are really just one procedure and should be associated with each other. For further example, a physician reviewing an admission report may find that it references laboratory tests or observations made contemporaneous with or previous to the patient arriving at the hospital. Should the physician decide to review these other records, she will have to perform additional searches to locate them. In some cases, this often cumbersome and time-consuming process results in care givers refraining from making complete use of the available patient information.

#### Brief Summary Text (9):

Some hospitals have purchased laboratory or information systems capable of long term storage of various records. While this may assist the hospital in retrieving past records, it may not help the admitting physician in referring to them, for he may not have access to the data directly or may not have the specific software required to retrieve the data. So with such advanced systems the physician is still provided with a paper copy for his records.

#### Brief Summary Text (10):

Furthermore, many existing laboratory and information systems record information in a variety of inconsistent formats. Some of these formats are proprietary to the manufacturer of the specific system. Each system may use a separate database scheme to gain access to the data. Substantial efforts to get these systems to communicate with each other have not yielded satisfactory results. For example, many large medical information systems use complicated data exchange protocols; but these protocols are unwieldy for simple, often portable instruments which lack the hardware and software capacity to conform to such protocols.

## Brief Summary Text (12):

What is needed is an effective alternative to creating paper records that must be copied and meticulously tracked, an alternative that would permit physicians to access the data economically and easily in their own offices. Such a system would permit a system user to enter a keyword to retrieve a specific data record of a patient, retrieve the requested record from whichever database it is stored to, reformat the data record with hypertext links to related patient records, and return the requested record to the system user for display on a browser. The system would preferably use the well-known Hypertext Markup Language (HTML) so that it could utilize inexpensive, standard software packages. The system would also be operable to format data records stored on the various databases of the computer network systematically, periodically, or automatically upon the creation of new, or the modification of existing, data records. The system would be operable to collect all data records pertaining to a specific patient, doctor, or other subject, modify them to support display through a Java applet, internet browser, or other universal display standard, generate additional patient files to organize the data records in a hypertext directory structure, and store the data records and files on a massmedia storage device such as a CD-ROM.

#### Brief Summary Text (15):

The invention may be adapted for use in a wide variety of <u>applications</u>, and is suitable for any environment in which numerous data records having one or multiple forms and/or formats are to be collected, stored, archived, retrieved, or translated. By way of illustration and not by way of limitation, the invention is presented in the context of a hospital environment, in which typically there are numerous computer systems in use by various health care professionals in one or several hospitals, and each professional often desires to have access to the patient records created by other professionals in that or other hospitals.

#### Brief Summary Text (22):

Yet another aspect of the present invention includes means for retrieving, processing, and storing all of a patient's data records that are available on the hospital's computer network onto a mass media storage device, such as a CD-ROM. For example, this process may be initiated by submitting a collection request identifying the patient's OD number or other identifier uniquely identifying the patient. The invention submits requests, passwords, macros, and programming codes, as appropriate, to each of the databases and workstations that include portions of the patient's cumulative record. Each record retrieved is processed and modified as above--as if the particular record had been requested by a system user. The invention not only collects applicable data records, but also multimedia clips, applets, browser extensions, "plug-ins," and other application modules addressed by programming codes embedded in the patient's data records. Substitute files explaining the absence of a linked record or module are created for data records or modules regarded as inappropriate for storage and distribution on an unsecured or uncontrolled medium. The invention would also create a "master file for the patient analogous to a "home page" for a website or the root directory of a tree structure, containing links to other patient-related files and data records. The master file may have hypertext links to patient records and to additional (secondary) control files, which in turn have hyperlinks to more patient data. After completing these collection routines, the invention would transfer the collection of data records, applets, browser extensions, and other data and programming modules to a massstorage device. In this manner a patient's cumulative patient record could be stored on a single CD-ROM or other high-density storage device, cheaply distributed to other hospitals or health care professionals serving the patient, and be conveniently accessed by those hospitals and health care professionals.

#### Detailed Description Text (2):

Referring now to FIG. 1, the invention is illustrated as a medical computer network 100, including a plurality of hospital based workstations 102 (which may be personal computers), a plurality of physician office workstations 104 which may also be personal computers, a plurality of databases 106 which may be provided by a multitude of vendors with separate data structures and data elements. The computer network 100 may also comprise an Admit, Discharge, and Transfer (ADT) system 108, a data translation and collection system 110, and a Hospital Information Systems (HIS) 111. The data translation and collection system 110 is not necessarily a separate physical element of the medical computer network 100, but is represented that way in the preferred embodiment for purposes of illustration only. It may be alternately recognized as a program application or even an aspect of a network operating system, the operations of which may be distributed over and performed by many different processors, workstations, and databases on the medical computer network 100. Databases 106, computer systems 108, 110, 111, workstations 102, and physician office workstations 104 may communicate with each other via a

communication network 112, which may be a combination of local and wide area networks, using Ethernet, serial line, wireless, or other communication standards. Communication network 112 may also be arranged in such a manner to be part of the Internet or as an individual Intranet. Workstation 102, 104 includes a "collection" folder 105 and a user interface 103 which may include a network browser or similar display, entry, and retrieval program. User interface 103 may be any means for permitting users to create data records and/or retrieve data records from the medical computer network 100 capable of supporting a network browser, such as the well known keyboard and video terminal combination.

### Detailed Description Text (9):

Commencing with FIG. 12A, in step 540 the data translation and collection system 110 receives a data record reference 520 (FIG. 11) in the form of a data request containing an address root 522 and descriptors 524 about the requested record. In some instances, a data request will originate from a system user accessing a hypertext link on a document displayed by the system's interactive display browser. In other instances, the data request will originate from a database or workstation application program. There may be several non-uniform but mutually distinguishable data request formats among the several hospital databases 106 (FIG. 1) on the medical computer network 100 (FIG. 1). Alternately, data requests may be uniformly and compatibly formatted for all records stored by various hospital databases 106 (FIG. 1). For example, the data requests may be in the form of a URL with optional data fields sent with it to assist in identifying the record to be retrieved.

### Detailed Description Text (16):

The steps by which the data translation and collection system 110 processes the selected data record are shown in FIGS. 12B and 12C. In step 566, the system uses the hypertext cipher 138 to determine whether or not the data is stored in a proprietary format. If it is, the applicable proprietary software is used to decompress or translate the data. This may be done on the manufacturer's database 106, another computer processing system, or by the data translation and collection system 110 a itself.

#### Detailed Description Text (26):

In step 650, the system uses the hypertext cipher 138 (FIG. 3B) to determine whether or not the data is stored in a proprietary format. If it is, the applicable proprietary <u>software</u> is used to decompress or translate the data. This may be done on the manufacturer's database 106, another computer processing system, or by the data translation and collection system 110 itself.

#### Detailed Description Text (35):

FIG. 14E shows the text report 724 with imported image 737 as displayed on computer display 118 using a network browser <u>software</u> package after the report has been translated and modified. A system user seeking additional information regarding the patient's demographics could select hypertext link 740. A system user seeking either the radiology or hemodynamic report for this procedure could select the appropriate hypertext link 744.

### <u>Detailed Description Text</u> (42):

In step 240, the system uses the Hypertext Cipher 138 (FIG. 3B) to determine whether or not the data is stored in a proprietary format. If it is, the applicable proprietary <u>software</u> is used to decompress or translate the data. This may be done on the manufacturer's database 106, another computer processing system, or by the data translation and collection system 110 itself.

### Detailed Description Text (49):

In step 284, the list of records to retrieve opened in step 212 is examined for the existence of records or program modules that have not yet been retrieved. If the list is empty, the data collection for the patient has been completed and the process advances to step 324 (FIG. 5E), discussed infra. If the list is not empty,

in step 288 a request is sent for the first entry remaining in the list, which may be for a data record or a program module. If it is a data record, after it is retrieved, it is checked in step 290 for encryption and decoded, if necessary, using proprietary software.

#### CLAIMS:

25. The method of claim 24, wherein associated <u>software</u> required to present said group of related data records is retrieved and stored on said storage device.

Previous Doc Next Doc Go to Doc#